Space Weather Forecast

Issued on Tuesday, 14 December 2021 at 12:59 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight chance of G1/Minor Geomagnetic Storms days 1-2 (14/15th). Potentially increasing solar activity.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar Activity was Low with one common-class flare observed from a developing sunspot region at 14/0825UTC. Minor background flares are also increasing in frequency due to a number of other developing sunspot regions now becoming visible on the solar disc. No Earth-directed CMEs have been observed in available imagery.

Solar Wind / Geomagnetic Activity: The solar wind speed was at background levels, whilst the magnetic field carried by the wind was mainly weak with only brief periods of strengthening. The important north-south magnetic field component of the solar wind remained mainly weak. Geomagnetic activity was mainly Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: The count of energetic particles (high energy protons) was at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar Activity is expected to be Low with a (perhaps increasing) likelihood of further isolated common-class flares given the developing and increasing numbers of sunspot regions on the visible disc. The chance of moderate class flares rises to 10% by day 4 assuming sunspot development continues at a similar rate to present.

Solar Wind / Geomagnetic Activity: The solar wind is expected to remain mainly quiet for the rest of today (14th Dec) but pending an increase in strength overnight into tomorrow (15th Dec) which may allow for Unsettled periods in the Kp, and a slight chance of reaching G1 Minor storm (Kp5) for a short time. For Days 3 and 4 (16th and 17th), solar winds are likely to wane again with mainly Quiet to Unsettled geomagnetic activity (Kp1-3).

Energetic Particles / Solar Radiation: The count of energetic particles (high energy protons) is most likely to persist at background levels with no solar radiation storms likely, this depending on upcoming developments of aforementioned sunspot regions.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	15	20	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	2	5	10	10
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	2	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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